

Supplementary Notes on the Structural Characteristics of *Pyrgus sibirica*, Reverdin, and *Pyrgus chapmani*, Warren.  
(Lep. Hesperiiidae). (With Plate IV.)

By B. C. S. WARREN, F.R.E.S.

In the autumn of 1935 Dr. Verity sent me a few mounts of the genitalia of *Pyrgus chapmani* which he had made, and some further specimens of *P. sibirica* for me to dissect myself. From an examination of his mounts Dr. Verity had been unable to decide whether his specimens were referable to *P. chapmani* or *P. sibirica*, and on turning to my work on the genus<sup>1</sup> the illustrations there were not sufficiently clear to enable him to solve the question.

Neither of these species is any better known now than when they were first described, although Reverdin described *P. sibirica* as long ago as 1911. These specimens of Dr. Verity gave me the opportunity of obtaining a set of rather better photographs of the genitalia of these species than were formerly available; and although I cannot add anything of value concerning the superficial features of either, I think that these clearer photographs will simplify comparison, and are therefore quite worth publishing. The new photographs have the immeasurable advantage of being taken at uniform magnifications (those in my former work were actually taken by men in different countries) and in some cases they are more highly magnified, enabling certain important characters to be seen clearly, which were quite invisible in the previous photographs.

Dr. Verity possesses six ♂ and four ♀ of *P. sibirica*, which he obtained from Bang-Haas in Dresden, and which he thinks formed part of the original series from which the specimens supplied to Reverdin came. Dr. Verity also has a short series of *P. chapmani*, these likewise came from Bang-Haas. The specimens of the latter were labelled "Transbaikalia," "Sayan Mountains" and "Tunkun Mountains." The localities from which I already knew this species were, Munko Sardyk (Sayan mountains), the Vitim district, and one ♂ merely labelled "S. Siberia." The species therefore is widely spread in southern Siberia, ranging from the Vitim Plateau, Transbaikalia, through the East and West Sayan Mountains; but the exact limits east and west are quite uncertain. On the other hand *P. sibirica* is, so far, known only from the Altai Mountains.

Turning to the anatomical characters which distinguish these insects, it proves that some variation exists in the formation, or rather one should say outline, of the cuiller, such as also exists in several other species, of which *P. alveus*, *P. foulquieri*, *P. centaureae* and *P. freija* are well-known examples. As in the case of these species, however, this variation is slight, and does not prevent the two species being identified by the features of this process, though it may produce a sufficiently close resemblance at times to cause some uncertainty to an observer who is not really familiar with the characteristic formation of each species.

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(1) *Monograph of the Tribe Hesperiiidi* (European species), etc. *Trans. Ent. Soc. Lond.* 1926, Part 1.

The difference, which exists in the formation of the cuiller in these two species, is to be found in the extent to which it is curved. In *P. sibirica* it is bent more towards the harpe, which causes (1) the proximal edge to assume an irregular outline, (2) reduces the width of the space between the apex of the cuiller and the base of the style, and (3) causes the point of greatest expansion of the cuiller to lie either just above, or in line with the summit of the stylifer.

In *P. chapmani* the cuiller is less bent towards the harpe, and has more the aspect of having been taken hold of by the apex and pressed downwards, away from the harpe. This causes (1) the proximal edge to be regular in outline, (2) increases the width of the space between the apex of the cuiller and the base of the style and (3) causes the point of greatest expansion of the cuiller to lie below the line of the summit of the stylifer. It is of course important to remember that in comparing the formation of the cuiller between one species and another, the clasp should in all cases be kept on one given plane. The position of the clasp in fig. 2 on the accompanying plate is the one in which the nature of the characteristics mentioned can be most readily observed. If the page is moved slightly when looking at the other figures (1, 2 and 4) so as to bring the clasp in them on to a corresponding horizontal plane, comparison will then be simplified and the differences quite easy to grasp. It is not possible always to mount a dissection in a manner to bring the ventral and dorsal processes of the genitalia into a uniform alignment, neither is it always possible to compensate fully for this in photographing a specimen, especially if it is wished to keep the dorsal portions nearly horizontal to the eye also. However, with figs. 1 and 3 only a very slight movement will be found necessary to bring the clasps into a position similar to that in fig. 2; but somewhat more will be required in the case of fig. 4.

The characters which have been described are not the only ones in which the cuillers in these two species differ. In my original description of *P. chapmani* I stressed the fact that the apex of the cuiller is sharply pointed in that species, and bluntly rounded in *P. sibirica*. This feature also, is affected by variation, and in some examples of *P. chapmani* (like fig. 4) the sharp point seen in fig. 3 is apparently rounded off, and consequently the specimen is suggestive of *P. sibirica*. But when this specimen is more highly magnified (shown in fig. 8), one sees the apex really terminates in a point, which is very different from the blunt, or rounded termination in *P. sibirica* (shown in figs. 5 and 6). A second specimen in which this apical peak is set a little back from the proximal edge of the cuiller is shown in fig. 9, while an equally magnified example of the terminal peak at its utmost development is shown in fig 7.

Connected with the formation of the dorsal termination of the cuiller there remains yet another very important difference between these two species. In *P. sibirica* the summit is crowned with a fringe of minute spines, seen very clearly in fig. 5 (one of Reverdin's specimens) less clearly in fig. 6, owing to a technical difficulty in focussing, but the spines are just as fully developed as in the other specimen. In *P. chapmani* the pointed summit of the cuiller is completely devoid of spines, as can be seen in figs. 7, 8 and 9. Although there is variation in the extent of the spine cap in *P. sibirica*, its presence or absence is a constant characteristic in these species.

It is interesting to recall that a somewhat similar character distinguishes that pair of closely related species *P. centaureae* and *P. freija*. They are, in actual fact, less closely related than might be supposed judging by their superficial resemblance; the totally different development of the antistyle indicates this, for in most closely related species in this genus, that process shows a considerable degree of similarity. *P. sibirica* and *P. chapmani* have more in common than the former pair of species, and in their case there is no striking difference in formation in the antistyle. The presence and absence then, of the terminal spine cap of the cuiller is all the more important; one may add that this spinal armature assumes very varied appearances in many species, and is always a character of marked constancy.

Turning to the dorsal parts of the structure, another marked feature in which these species differ, is the restriction of the uncus at the point of junction with the tegumen in *P. sibirica*; in *P. chapmani* at the same point the uncus is at its greatest width (compare figs. 1, 2, 3 and 4).

I use the term "tegumen" in a restricted sense, applying it to the 9th tergite only; this corresponds with the use of the term "tegmen" by Chapman, which I followed in my monograph. I have since abandoned the latter in favour of "tegumen," for this term, having first been restricted to dorsal parts only, and then further by the use of the very essential term "uncus," could apply to nothing other than the 9th tergite.

The formation of the uncus itself is slightly tapering to the distal point in *P. chapmani*, and more or less equal in width throughout in *P. sibirica*. The proximal features of the uncus are very characteristic in many species, and should have been given greater prominence in my monograph, but, as in the case of the spine system of the cuiller, the photographs illustrating that work were not taken with a view to demonstrating these peculiarities. I may add here that the term "uncus" as used by Reverdin, not only covers the actual uncus (10th tergite) but also certain developments of the lateral portions of the 10th abdominal segment, which in some cases are so enlarged as to extend until they become dorsal and unite with each other, forming a link between the true 9th and 10th tergites. To have demonstrated these points would have necessitated replacing a large number of Reverdin's photographs with others, a course which was impracticable at that time. It would also have caused a lack of uniformity between my descriptions and those previously published by Reverdin.

I would once again emphasize that the characteristics referred to as distinguishing *P. sibirica* and *P. chapmani* are constant, though subject to a certain range of variability. This of course in no way impairs the taxonomic value of these features, and there can remain no doubt that these two, superficially somewhat similar-looking insects, are distinct species.

In conclusion I must express my thanks to Dr. Verity for the loan of his material, and to Dr. Carl of the Geneva Natural History Museum for the loan of one of Reverdin's mounts of the genitalia of a paratype of *P. sibirica*.



## EXPLANATION OF PLATE.

Male armatures of *P. sibirica* and *P. chapmani*.

1. *P. sibirica*, Rev.  $\times 18$ . Slide No. 219 Verity/1262 Warren.
2. *P. sibirica*, Rev.  $\times 18$ . Slide No. 220 Verity/1263 Warren.
3. *P. chapmani*, Wrn.  $\times 18$ . Slide No. 49 Verity.
4. *P. chapmani*, Wrn.  $\times 18$ . Slide No. 143 Verity.
5. *P. sibirica*, Rev.  $\times 48$ . Slide No. 505 Reverdin.
6. *P. sibirica*, Rev.  $\times 48$ . Slide No. 220 Verity/1263 Warren.
7. *P. chapmani*, Wrn.  $\times 48$ . Slide No. 51 Verity.
8. *P. chapmani*, Wrn.  $\times 48$ . Slide No. 143 Verity.
9. *P. chapmani*, Wrn.  $\times 48$ . **Type.** Slide No. 191 Warren.

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### Collecting Notes for late summer, 1936.

By H. B. D. KETTLEWELL, M.A., M.B.

My wife and I arrived in the Folkestone district on 15th August, where we remained until the 19th, four days of bad weather. Very little was obtained by day. Half-grown larvae of *Lophopteryx cuculla* were beaten from maple at the rate of about two per hour, which was scarcer than last year.

Once again we assembled to newly hatched females of *Lasiocampa trifolii* near Lydd, and for the sake of the comparison of the habits of Romney Marsh *trifolii* with those in other localities, I will briefly state the following facts:—

The females call strongly the evening of the first day of hatching, but if prevented from pairing, will call a second night and less strongly a third; after this they cease to call. Males commence to fly upwind soon after 8 p.m. (summer time), they come fast and straight and always low down and are not easily persuaded to leave. If left alone they collect in large groups and heaps on the outside of the muslin bag containing the female and become so closely intertwined that it is almost impossible to collect any one wanted specimen. Very large numbers arrive in the course of an evening, anything up to sixty or seventy being normal. Pairing lasts for only a few minutes, after which they separate and the female becomes entirely refractory to males.

I here want to mention a point in connection with the variation of this species in Kent. R. South, in his paragraph about the "Romney Marsh form," states that it is yellow as distinct from the usual "brown" form of the other localities, but that "in both forms one or both cross markings may be faint or quite absent and even the white central dot, which varies in size and shape, may be missing."

Be this as it may, there still remains to describe and name (which I hope to do in the near future) a form which, so far as I can ascertain, is unique to the district. It is absolutely distinct from the local type and in the hundreds of *trifolii* I have bred and caught, I have never found an intermediate between it and the local type. In this form all the wings are unicolorous having no bands whatever in either sex.

More striking still, is the entire absence of the dark iris encircling the white central dot, and so far as I know in these forms, this is always the case. In corresponding females the white dot itself is generally absent. In this form the ground colour varies, as in the